*This document contains Part 4 (pp.64–67) of Chapter 2 of the National Coastal Condition Report III.*

*The entire report can be downloaded from http://www.epa.gov/nccr*

# National Coastal Condition Report III

## Chapter 2: National Coastal Condition

## Part 4 of 5

December 2008

## Large Marine Ecosystem Fisheries

Ten LMEs are found in the waters bordering U.S. states and island territories around the world (Figure 2-16). The climates of these LMEs vary from subarctic to tropical, and their productivities range from low to high based on global estimates of primary production (phytoplankton). Some of these LMEs (i.e., the Northeast U.S. Continental Shelf, Caribbean Sea, Gulf of Mexico, California Current, Gulf of Alaska, Chukchi Sea, and Beaufort Sea LMEs) border multiple countries, such as the United States and Russia. As a result, information about fishery stocks in the Caribbean Sea, Chukchi Sea, and Beaufort Sea LMEs is unavailable. In addition, several of the U.S. island territories in the Pacific Ocean are not located within an LME. The fisheries in the waters surrounding these territories are managed on a regional level with the Insular Pacific-Hawaiian LME as the NMFS Western Pacific Region (NOAA, 2007g).

As of 2004, many marine fish stocks in U.S. LMEs were healthy, and other stocks were rebuilt. Despite this progress, a number of the nation's most significant fisheries still face serious challenges, including the California Current and Gulf of Alaska LME demersal fish, Southeast U.S. Continental Shelf LME snapper-grouper complex, and Northeast U.S. Continental Shelf LME mixed-species stocks (NMFS, In press).

In 2004, NOAA's Office of Sustainable Fisheries reported on the status of 688 marine fish and shellfish stocks with respect to their overfished and overfishing condition (NMFS, 2005c). According

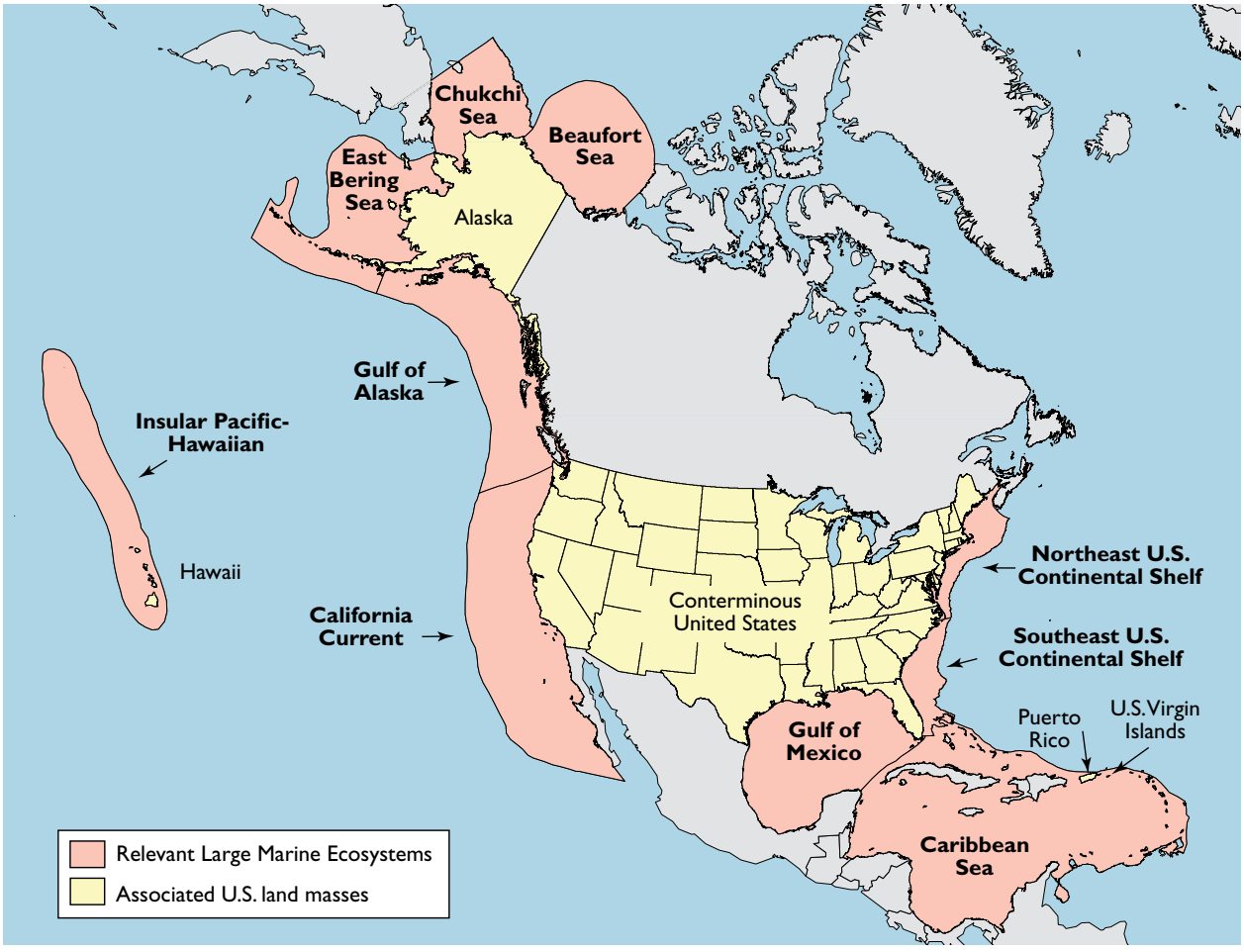



**Figure 2-16.** U.S. states and island territories are bordered by 10 LMEs (NOAA, 2007g).

to the Magnuson-Stevens Fishery Conservation and Management Act of 1996 (and reauthorized in 2006), a fishery is considered overfished if the stock size is below a minimum threshold, and overfishing is occurring if a stock's fishing mortality rate is above a maximum level. These thresholds and levels are associated with maximum sustainable yield-based reference points and vary between individual stocks, stock complexes, and species of fish. Of the 200 fish stocks whose status with respect to overfished condition is known, 144 were not overfished and 56 stocks or stock complexes were overfished (NMFS, 2002; 2005c). The overfishing status of 236 stocks is known, of which 44 stocks or stock complexes (19%) have a fishing mortality rate that exceeds the overfishing threshold. The NMFS has approved rebuilding plans for the majority of overfished stocks. Five FMP amendments were approved in 2004 to implement final rebuilding plans for 23 stocks in the Northeast U.S. Continental Shelf, Southeast U.S. Continental Shelf, Gulf of Alaska, and East Bering Sea LMEs.

The number of stocks considered to be overfished has decreased from 92 in 2000 and 81 in 2001 to 56 in 2004. Some of the stocks whose status has changed are located in the Gulf of Alaska, California Current, Northeast U.S. Continental Shelf, and Gulf of Mexico LMEs. The Pacific whiting (a demersal fish) stock of the Gulf of Alaska and California Current LMEs has been fully rebuilt, and overfishing is no longer occurring. Northeast U.S. Continental Shelf LME black sea bass stock is also no longer overfished. Three more stocks—lingcod, Pacific ocean perch (Gulf of Alaska and California Current LMEs), and king mackerel (Gulf of Mexico LME)—have increased in abundance to the point they also are no longer overfished. Rebuilding measures for all these stocks will continue until each stock has been fully rebuilt to a level that provides the maximum sustainable yield (NMFS, 2005a).

Commercial landings of fish can be measured by pounds of fish landed and by the value (in dollars) that those fish bring to the economy (Table 2-4). In 2004, Alaska led all states in pounds of fish landed (5.4 billion) and in the value of fisheries landings ($1.2 billion) (NMFS, 2005a). Alaska pollock, described as the largest food fish resource in the world, has been ranked first nationally (in pounds harvested) of the major U.S. domestic commercial species landed from 2001 through 2004. Menhaden (e.g., fatback, bugfish, munnawhatteaug), an industrial species used as bait and for fish meal and oil, is one of the most important fisheries on the Atlantic coast, with the majority of fish caught from estuaries and nearshore coastal waters. Nationally, the menhaden fishery ranked second by mass from 2000 through 2004, whereas the Pacific salmon fishery ranked third from 2001 through 2004, and the cod fishery (Atlantic and Pacific combined) has consistently ranked fourth. The shrimp fishery was ranked first by value in 2001 and 2002, then second in 2003 and 2004—the reverse of the crab fishery, which was ranked second in monetary value for the first 2 years and then first for the later 2 years (2003 and 2004). The American lobster fishery was consistently ranked third by value throughout this timeframe, Alaska pollock ranked fourth in 2001 and 2002, and flatfish and scallops ranked fourth in 2003 and 2004, respectively (NMFS, 2002; 2003; 2004; 2005c).

**Table 2-4. Top 10 Commercial Species Landed in 2004 (NMFS, 2005c)**

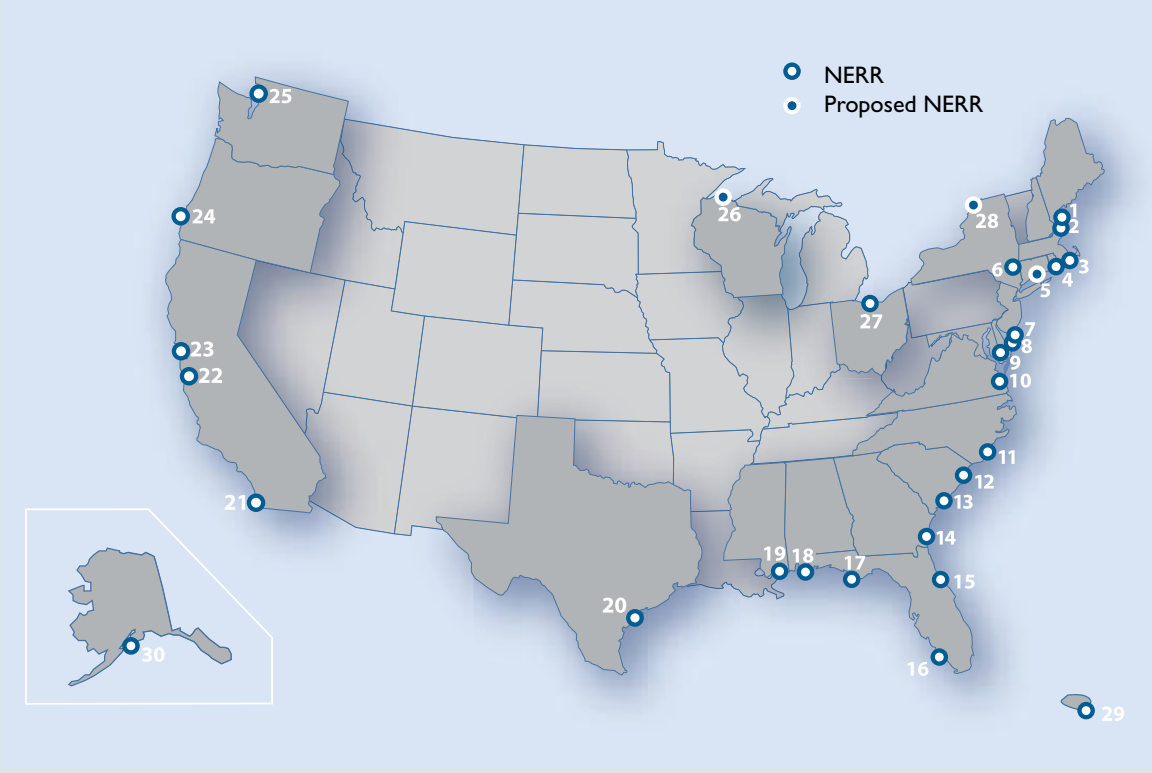
| | Top 10 by Quantity | | Top 10 by Value | |
|---|---|---|---|---|
| Rank | Species | Pounds (thousands) | Species | Dollars (thousands) |
| 1 | Pollock | 3,361,989 | Crabs | $447,978 |
| 2 | Menhaden | 1,497,610 | Shrimp | $425,605 |
| 3 | Salmon | 737,935 | Lobsters | $344,070 |
| 4 | Cod | 602,732 | Scallops | $322,098 |
| 5 | Hakes | 502,502 | Flatfish | $300,896 |
| 6 | Flounders | 440,699 | Pollock | $277,029 |
| 7 | Crabs | 314,428 | Salmon | $272,730 |
| 8 | Shrimp | 308,275 | Cod | $169,647 |
| 9 | Herring (sea) | 255,931 | Clams | $158,782 |
| 10 | Sardines | 199,613 | Oysters | $111,125 |

# Highlight

## Integrating Science and Technology to Support Coastal Management Needs: The National Estuarine Research Reserve System-wide Monitoring Program

There are 27 National Estuarine Research Reserves (NERRs) covering more than 1 million acres of estuarine waters and adjoining lands across the continental United States, Alaska, and Puerto Rico (see map) (NERRS, 2003). NOAA's National Estuarine Research Reserve System (NERRS) was established by the Coastal Zone Management Act of 1972, which created reserves to protect estuarine areas, provide education opportunities, promote and conduct estuarine research and monitoring, and transfer critical information to coastal managers. In 1995, the NERRS established a System-wide Monitoring Program (SWMP) to collect data on estuarine biodiversity and water and weather conditions, as well as to classify watershed habitats and land-use changes. The SWMP was designed to track short-term variability and long-term changes in estuarine ecosystems and to understand and forecast how human activities and natural events can affect these ecosystems.

In 2005, the NERRS celebrated the SWMP's 10th anniversary. The long-term data sets of the SWMP make it possible to establish baseline conditions, examine both intra-annual (seasonal) and interannual patterns in estuarine systems, and study the effects of large-scale (e.g., El Niño and La Niña climatic conditions, sea-level rise, hurricanes, Nor'easters) and localized (e.g., floods, drought, contaminant spills) episodic events.



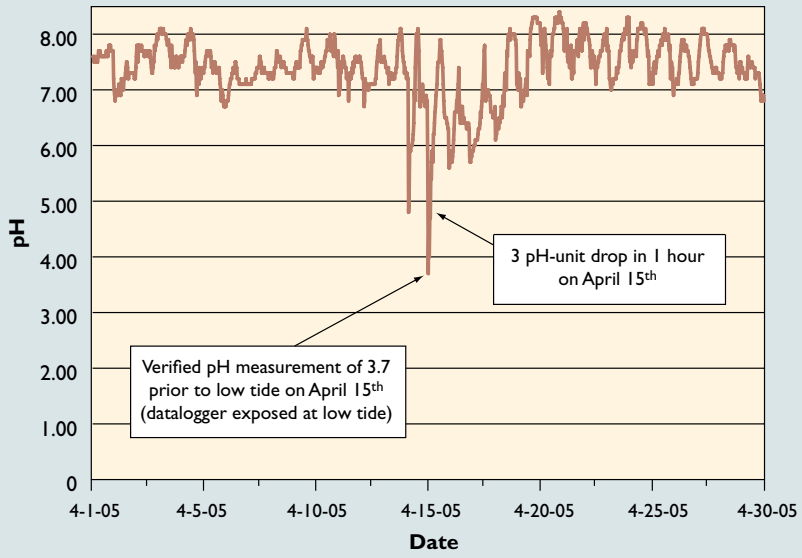

Estuaries of the NERRS are found on coastlines across the United States (NERRS, 2003).

The NERRS has compiled a subset of examples from across the 27 sites that demonstrate the application of water and weather monitoring data to local, regional, and national coastal management needs. One such example is the Grand Bay Reserve in Mississippi.

## Grand Bay Reserve, MS—SWMP Data Used to Track Effects of a Phosphate Spill

The western border of the Grand Bay Reserve in southeastern Mississippi is lined with industrial plants. Grand Bay Reserve staff rely on SWMP data to monitor baseline water quality conditions and identify anomalies resulting from contaminant spills or other pollution episodes. One such incident occurred on April 14, 2005, when levees surrounding containment ponds at a fertilizer manufacturing plant collapsed after two weeks of record-breaking rain. A large volume of effluent water from the plant entered an adjacent tidal lake that lies within the Grand Bay Reserve's boundaries, resulting in an abrupt drop in pH levels. An SWMP datalogger located in the center of the lake recorded that the water's pH level fell from 7.5 to 3.7 within an hour (see figure). Eleven days later, phosphorus levels in the lake were ~5,000 times greater than before the spill and chlorophyll *a* concentrations had fallen to zero, indicating that primary productivity had ceased. Continual SWMP monitoring at Grand Bay Reserve captured the effects of this spill and will, in conjunction with additional monitoring, document the full recovery of this vital ecosystem. Following this incident, Grand Bay Reserve staff presented the SWMP data to the Mississippi Commission on Marine Resources and worked with the Mississippi Department of Environmental Quality staff to recommend corrective actions and restoration measures for the spill site (Owen and White, 2005).

More information about the NERRS program is available on NOAA's NERRS Web site at http://www.nerrs.noaa.gov. Monitoring data for each national reserve are available from the NERR's Centralized Data Management Office at http://cdmo.baruch.sc.edu.




NERRS' SWMP measurements showing the effect of an April 14, 2005, phosphate spill on pH in Bangs Lake, MS (Owen and White, 2005).